

WHAT IS CLAIMED IS:

1. A rechargeable electrochemical cell comprising:

a first electrode;

a second electrode; and

a third electrode electrically isolated from the second electrode, wherein the cell is
5 discharged upon application of a load across the first electrode and the second electrode, and
the cell is recharged upon application of the voltage across the first electrode and the third
electrode.
2. The rechargeable electrochemical cell as in claim 1, wherein the first electrode and the
second electrode remain connected during recharging.
3. The rechargeable electrochemical cell as in claim 1, wherein the second electrode is in
isolation from the voltage across the first electrode and the third electrode.
4. The rechargeable electrochemical cell as in claims 3, wherein the isolation is
effectuated by a transformer, a power supply, a switch, a capacitor, or a combination
comprising at least one of the foregoing.

5. A rechargeable electrochemical cell system comprising:
- a plurality of cells, each cell comprised of a first electrode, a second electrode, and a third electrode electrically isolated from the second electrode, wherein the cell system is discharged upon application of a load across a discharge circuit comprising the first electrodes and the
- 5 second electrodes, and wherein the cell is recharged upon application of a voltage across a recharging circuit comprising at least one of the first electrodes and at least one of the third electrodes.
6. The rechargeable electrochemical cell system as in claim 5, wherein the first electrode and the third electrode remain connected during recharging.
7. The rechargeable electrochemical system as in claim 5, wherein the voltage for recharging is applied by one or more transformers.
8. In the rechargeable electrochemical cell system as in claim 7, wherein the transformer comprises a single primary winding and a plurality of secondary windings.
9. The rechargeable electrochemical cell system as in claim 8, wherein the primary winding is driven by a power source.
10. The rechargeable electrochemical cell system as in claim 9, further comprising a switching power converter coupled to the power source and the primary winding.

11. The rechargeable electrochemical cell system as in claim 10, wherein the control unit comprises an oscillator.
12. The rechargeable electrochemical cell system as in claim 11, wherein the switching device comprises a MOSFET device.
13. The rechargeable electrochemical cell system as in claim 9, wherein the power source is controlled by a control unit.
14. The rechargeable electrochemical cell system as in claim 13, further comprising a switching power converter coupled to the power source and the primary winding.
15. The rechargeable electrochemical cell system as in claim 13, wherein the control unit comprises an oscillator.
16. The rechargeable electrochemical cell system as in claim 15, wherein the switching device comprises a MOSFET device.
17. The rechargeable electrochemical cell system as in claim 8, wherein each secondary winding is coupled to a third electrode.
18. The rechargeable electrochemical cell system as in claim 17, further comprising a diode between at least one pair of the secondary winding and the third electrode.

19. The rechargeable electrochemical cell system as in claim 17, further comprising a rectifier between at least one pair of the secondary winding and the third electrode.
20. The rechargeable electrochemical cell system as in claim 5, wherein the voltage across the first electrode and the third electrode is provided from a power supply.
21. The rechargeable electrochemical cell system as in claim 20, further comprising a cell conditioning unit between the power supply, and the recharging circuit of each cell in the system.
22. The rechargeable electrochemical cell system as in claim 21, wherein the cell conditioning unit comprises a switching power converter.
23. The rechargeable electrochemical cell system as in claim 21, wherein the cell conditioning unit comprises a switching power converter.
24. The rechargeable electrochemical cell system as in claim 21, wherein the cell conditioning unit comprises a battery parameters monitor.
25. The rechargeable electrochemical so system as in claim 21, wherein the cell conditioning unit comprises signal conditioning system.

26. The rechargeable electrochemical cell system as in claim 21, wherein the cell conditioning unit comprises a rectifier.
27. The rechargeable electrochemical cell system as in claim 21, wherein the cell conditioning unit comprises a filter.
28. The rechargeable electrochemical cell system as in claim 5, wherein the voltage is applied across the recharging circuit with a capacitor.
29. The rechargeable electrochemical cell system is in claim 28, wherein the capacitor is coupled to a power supply.
30. The rechargeable electrochemical cell system is in claim 29, wherein the capacitor is charged by the power supply by operation of a switch device.
31. The rechargeable electrochemical cell system as in claim 28, wherein the capacitor is connected across the recharging circuit via a switch between capacitor and the first electrode and the switch between the capacitor and the third electrode.
32. The rechargeable electrochemical cell system as in claim 28, wherein the capacitor is coupled to the first electrode via a first switch, and wherein the capacitor is coupled to the second electrode via a second switch, and wherein the power supply is coupled to the capacitor via a third switch.

33. The rechargeable electrochemical cell system as in claim 32, wherein operation of the third switch, and operation of the first and second switches, are optimized based on charging the capacitor and charging the individual cells.

34. The rechargeable electrochemical cell system as in claim 5, wherein the cell is recharging upon application of a selective voltage across one or more selected recharging circuits.

35. The rechargeable electrochemical cell system as in claim 34, wherein selected recharging circuits are selected based on charging requirements.

36. The rechargeable electrochemical cell system as in claim 5, wherein at least a portion of the plurality of cells are arranged in series.

37. The rechargeable electrochemical cell system as in claim 5, wherein at least a portion of the plurality of cells are arranged in parallel.